

## Sources of Exposure

## Toxicokinetics and Biomonitoring

## Biomarkers/Environmental Levels

### General Populations

- It is unlikely that general population will be exposed to bis(chloromethyl)ether because it is only used in closed systems in the United States and it rapidly degrades in the environment.
- Exposure through water, food, or soil is unlikely to be significant.

### Occupational Populations

- The most likely means of occupational exposure is inhalation of bis(chloromethyl)ether vapors during the production and use of chemicals such as chloromethyl methyl ether, in which bis(chloromethyl)ether may occur as a contaminant or be formed inadvertently.

### Toxicokinetics

- No information on the toxicokinetics of bis(chloromethyl)ether in humans or animals is reported.
- It is expected that bis(chloromethyl)ether is rapidly degraded in the aqueous environment of tissues, forming formaldehyde and HCl.

### NHANES Biomonitoring

- There are no data regarding levels of bis(chloromethyl)ether in the general population.

### Biomarkers

- There are no specific exposure biomarkers for bis(chloromethyl)ether.

### Environmental Levels

#### *Air*

- There are no recent monitoring data for air levels bis(chloromethyl)ether in the United States.

#### *Water*

- There are no recent monitoring data for water levels of bis(chloromethyl)ether in the United States.

#### *Sediment and Soil*

- There are no monitoring data for levels of bis(chloromethyl)ether in the sediment or soil in the United States.

### Reference

Agency for Toxic Substances and Disease Registry (ATSDR). 2017. Toxicological Profile for Bis(chloromethyl)ether. Atlanta, GA: U.S. Department of Health and Human Services, Public Health Services.

# ToxGuide™ for Bis(Chloro- methyl)Ether



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U.S. Department of Health and  
Human Services  
Public Health Service  
Agency for Toxic Substances  
and Disease Registry  
[www.atsdr.cdc.gov](http://www.atsdr.cdc.gov)



## Chemical and Physical Information

## Routes of Exposure

## Relevance to Public Health (Health Effects)

### Bis(chloromethyl)ether

- Bis(chloromethyl)ether is a colorless liquid with a strong, unpleasant odor. It dissolves easily in water and readily evaporates into air.
- Bis(chloromethyl)ether was used in the production of several types of polymers, resins, and textiles; however, most of these uses have stopped.
- Currently, bis(chloromethyl)ether is only used in small amounts in fully enclosed systems in manufacturing facilities.
- Small quantities may be formed as an impurity during the production of chloromethyl methyl ether.

- Inhalation – Most likely route of exposure for the general and occupational populations.
- Oral – Not a likely route of exposure for the general or occupational populations.
- Dermal – Not a likely route of exposure for the general or occupational populations.

### Bis(chloromethyl)ether in the Environment

- Due to the relatively short half-life of bis(chloromethyl)ether in both air and water, it is unlikely that significant transport or partitioning between media occurs.
- In the air, bis(chloromethyl)ether is primarily degraded by reacting with photochemically-generated free hydroxyl radicals or by hydrolysis.
- In water, bis(chloromethyl)ether is rapidly hydrolyzed, with a half-life of approximately 38 seconds.
- It is expected that bis(chloromethyl)ether would rapidly hydrolyze upon contact with moisture in soil or would react with soil constituents and therefore not persist for significant periods in the soil.
- Because bis(chloromethyl)ether is rapidly hydrolyzed, it will not bioaccumulate.

**Health effects are determined by the dose (how much), the duration (how long), and the route of exposure.**

### Minimal Risk Levels (MRLs)

#### *Inhalation*

- No acute- ( $\leq 14$  days) or chronic ( $\geq 365$  days) duration inhalation MRLs were derived for bis(chloromethyl)ether.
- An intermediate duration (15–364 days) inhalation MRL of 0.0003 ppm was derived for bis(chloromethyl)ether.

#### *Oral*

- No acute- ( $\leq 14$  days), intermediate- (15–364 days), or chronic ( $\geq 365$  days) duration oral MRLs were derived for bis(chloromethyl)ether.

### Health Effects

- In animals, inhalation of bis(chloromethyl)ether resulted in respiratory effects (distress, increased lung weight, pneumonitis, and tracheal and bronchial hyperplasia) after acute and intermediate duration.
- Neurological effects such as extreme irritability was seen in rats and hamsters after inhalation exposure.
- Lung cancer has been associated with occupational exposure to bis(chloromethyl)ether.
- Nasal and lung tumors have been seen after inhalation exposure, and skin cancer has developed after dermal exposure in animals.
- Bis(chloromethyl)ether has been classified by the U.S. Department of Health and Human Services, the U.S. Environmental Protection Agency, and by the International Agency for Research on Cancer as a human carcinogen.

### Children's Health

- It is not known if children are more sensitive to bis(chloromethyl)ether exposure than adults.